Patent Application of

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for

TITLE: Perpetual Solar and Seasonal Calendar System

CROSS-REFERENCE TO RELATED APPLICATIONS

This application is a Continuation-In-Part of Serial No. 09/986,566 filed on 11/09/2001.

BACKGROUND OF THE INVENTION -- Field of Invention

[0001] This invention is a perpetual calendar system that improves upon the Gregorian calendar in several ways with the foremost primary improvement being the accurate calculation of and the determination of which centuries should receive a 25th leap day. Another major feature of this invention is the alignment of the months with the four seasons.

BACKGROUND OF THE INVENTION -- Prior Art

[0002] Julius Caesar, on the advise of the Greek, Sosigenes, authorized the use of the Julian calendar in B.C. 46 (year 709 of Rome). This system remained in effect for the Western World until AD 1582 at which time several countries switched to the Gregorian calendar. St. Bede, the Venerable, an Anglo-Saxon monk, concluded in AD 730 that the Julian year was 11 minutes and 14 seconds longer than the solar year, but nothing was done to correct this discrepancy for another 800 years. To make up for the accumulated error in time, Pope Gregory XIII decreed that the day following October 4, 1582, should be October 15, 1582, thus starting the Gregorian calendar.

[0003] The Gregorian calendar was first adopted by France, Italy, Spain, Portugal, and Luxembourg. The British government, including the American colonies, switched to the Gregorian calendar in 1752. The day following September 2, 1752, was decreed to be September 14, yielding a loss of 11 days. Under the new Gregorian calendar, New Year's Day was **moved** from March 25th (Julian calendar) to January 1st, which is a very **peculiar** place to have the new year start. Another shortcoming of the Gregorian calendar is that it only takes the solution to the 25th leap day so far; it does **not** bring the problem to **conclusion**.

[0004] Leap years are necessary because the solar year is 365 days 5 hours 48 minutes and 46 seconds long. That's 20,926 seconds more than 365 days. In one hundred years that accrues to 2,092,600 seconds (2,092,600 / 86,400 seconds per day = 24.2199074 days -- every century gets 24 leap days, the dilemma is determining **which centuries get** the 25th leap day). Five hours 48 minutes and 46 seconds is 11 minutes and 14 seconds short of 1/4 day; if it were exactly 6 hours, the Julian calendar would have worked perfectly (add an extra day every four years without skipping a beat). At 25 leap days per century, the Julian calendar was accurate to within one day in 128 years.

[0005] The Gregorian calendar improved upon the Julian calendar by aligning a little more closer to the solar year, but not completely with the solar year. The Gregorian calendar currently calculates time at the rate of 24.25 leap days per century. It works this way: Leap years occur every four years starting on the first year of the century; however, century years that are not evenly divisible by 400 (1800, 1900, 2100, etc.) are **not** leap years for the Gregorian calendar, but they are for the Julian calendar. This means that the Gregorian calendar allows for the 25th leap day to be added to every fourth century. As already stated, the Gregorian calendar has 24.25 leap days per century ((3 x 24 + 25) / 4 = 24.25 leap days per century), which makes it accurate to within one day in 3,323 years.

[0006] If we use the advice presented by Britannica encyclopedia (don't add the 25th leap day to centuries that are evenly divisible by 4000 (10 cycles of 400 years)), the Gregorian calendar leap day ratio would change from 24.25 to 24.225 days per century in two thousand years. ((30 x 24) + (10 x 25) -1) / 40 = 24.225 leap days per century. At 24.225 leap days per century, the Gregorian

calendar is accurate to within one day in 20,000 years (it's precisely 19,636.363 years). This will become more apparent as you view the following ***manual*** algorithmic scenario (algorithm #1) which is generated as a result of the Britannica prescription. This algorithm clearly shows some of the flaws of the Gregorian calendar.

Algorithm #1 Gregorian Calendar

Solar year = 365 days 5 hours 48 minutes & 46 seconds

5 hrs. 48 min. 46 sec. = 20,926 seconds

x 100 years

surplus seconds: 2,092,600

2,092,600 / 86,400 = 24.2199074074 days per century

.2199074074 days = 19,000 seconds of surplus

19,000 x 4 centuries =	76,000	**surplus** seconds
(add 25th day)	- 86,400	(400 years)
	-10,400	**deficit**
	x 10	time periods
	-104,000	deficit
(**don't** add 25th day)	+ 86,400	(4,000 years)
	-17,600	deficit
	x 5	time periods
	-88,000	deficit
(**skip** 12/31)	+ 86,400	(20,000 years)
	-1,600	deficit
	x 54	time periods
	-86,400	deficit
(**skip** 12/30)	+ 86,400	(1,080,000 years)
	0	(-55 days)

Gregorian calendar **aligned** with the solar year.

[0007] As you can see, .25 is greater than .2199074; therefore, the Gregorian calendar is **over compensating** causing a **deficit** of time when it adds the 25th leap day to the fourth century. The original **surplus** of 19,000 seconds (.2199074 days) every 100 years grows to 76,000 seconds in 400 years. When we add a 25th leap day for that century we over compensate by 10,400 seconds causing a deficit of time. That deficit grows to 104,000 seconds after 4000 years at which time we **do not** add the 25th leap day. This compensation still leaves us with a deficit of 17,600 seconds which grows to 88,000 seconds in 5 time periods (20,000 years). So every 20,000 years we not only **do not add** the 25th leap day, we must also **subtract** one day from our calendar. This process continues exactly this way for 1,080,000 years at which time we **subtract** 2 days and then the cycle starts over again. The **fallacy** with this system, as prescribed by Britannica Encyclopedia, is, if we continue using the algorithmic scenario "400 years, 4,000 years, 20,000 years...." we would eventually need to **delete** 55 common days from our calendar in order to align with the solar year.

[0008] In brief, the Gregorian calendar is deficient in three major areas:

(1) It does not calculate the 25th leap day efficiently enough for an advanced civilization;

(2) With New Year's Day occurring on January 1 (12 days into winter), we have two winters every year; and

(3) All of our seasons fall in the middle of a month instead of at the beginning of a month.

[0009] The primary difference distinguishing this invention from other perpetual calendar inventions such as U.S. Pat. No. 6,116,656 issued Sept. 12, 2000, to Terrance A. Glassman and U.S. Pat. No. 4,813,707 issued March 21, 1989, to Mohammed K. Habib and to all other calendaring inventions is the other calendaring inventions are geared towards and therefore coincide with one or more of the calendar systems in use today. They are designed to function with what the major calendar systems yield (or allow). Therefore, they are merely creative extensions of existing systems. The instant invention differs in that it sets a new precedence; namely, all four seasons fall on the first of a month, the New Year starts on the first day of spring, and it determines which centuries receive the 25th leap year. The instant invention not only identifies the problem of the 25th leap year, it also solves the age old problem of aligning the calendar with the solar year by determining which centuries get the 25th leap year and which centuries don't get the 25th leap year over a period of 86,400 years at

which time the instant invention is aligned with the solar year making it a truly perpetual calendar. The algorithm that calculates which centuries get the 25th leap year, hereafter known as the JAK-Perpetual-Solar-Calendar algorithm, can be incorporated into any computer or electronic device and programmed to run, thus alleviating any human intervention.

BACKGROUND OF THE INVENTION -- Objects and Advantages

[0010] One of the advantages the present invention has over the Gregorian Calendar System is it utilizes an efficient time calculating multi-tiered cyclic algorithm that incorporates a 400-year cycle within a 3200-year cycle within an 86,400-year cycle in the process of determining which iteration of the 400-year cycles is to receive the 25th leap year. Simply put, the instant invention is on an 86,400 year major cycle that is much more efficient and accurate than the 1,080,000 year major cycle that the current state of the art (Britannica encyclopedia) surmises. The JAK-Perpetual-Solar-Calendar *manual* algorithm allows for the alignment of the present invention with the solar year after 86,400 years, which is numerically displayed in the table illustrated in Fig. 2.

[0011] Clearly, an 86,400-year cycle is more desirable that a 1,080,000-year cycle, not even taking into consideration the fact that 55 common days will have to be deleted from 54 different years using the suggestion by Britannica, which is still more efficient than the current mechanics of the Gregorian calendar.

[0012] The present invention accomplishes the following objectives:

(1) It efficiently calculates the 25th leap day and signifies which centuries are to receive it, a feat that no previous calendar system has been able to accomplish until now;

(2) It aligns with the four seasons and brings some semblance of intelligence to our reckoning of time;

(3) It starts the New Year at the beginning of spring, where it belongs;

(4) It is simply a smart system that any advanced civilization would require and use.

[0013] The JAK-Perpetual-Solar-Calendar *manual* algorithm can be incorporated into any electronic device, computer, etc., as an *automatic* algorithm for the purpose of determining and printing a list of future dates to be used in the business world, the political world, or for any other reason.

[0014] A better understanding of the advantages of the present invention will become apparent as you view the JAK-Perpetual-Solar-Calendar manual algorithm (algorithm #2), the table of information that is derived from it, and the description of their efficient productions.

SUMMARY

[0015] The Julian calendar tried to align with the solar year by having 25 leap days per century, one leap year every 4 years. The Gregorian calendar attained a closer alignment with the solar year by having 24.25 leap days per century. A suggestion by Britannica brings it even closer to perfection yielding 24.225 leap days per century. The present invention brings the problem of the 25th leap day to closure by incorporating an all encompassing algorithm that precisely calculates the exact centuries to which the 25th leap day should be added making it a true perpetual calendar. The present invention also aligns with the four seasons and puts New Year's day in its proper place.

BRIEF DESCRIPTION OF THE FIGURES

[0016] Fig. 1 provides a table illustrating the layout of the year for this invention;

Fig. 2 provides a table depicting the results of the JAK-Perpetual-Solar-Calendar algorithm.

DETAILED DESCRIPTION OF THE INVENTION

[0017] A physical copy of the Perpetual Solar and Seasonal Calendar can take the form of various multiple constructed arrangements, whether they be printed or otherwise.

[0018] Fig. 1 is a table that clearly shows April 1st is the beginning of the year for the present invention. It also shows that the months May through September are all 31-day months and all other months have 30 days with the exception of March, which gets the periodic leap day.

[0019] Fig. 2 is a table that shows the 400-year cycles within the 3200-year cycles within the 86,400-year cycle of the Perpetual Solar and Seasonal Calendar / solar-year alignment process. It is derived from the JAK-Perpetual-Solar-Calendar manual algorithm and it clearly illustrates that the century years occurring at the **top** of the twenty-seven 3200-year cycles (years 0, 3200, 6400, ...) are those years that **do not** get the 25th leap day. The only **exception** to that rule is the **first year** of the table, year 0, which will become year 86,400 when the cycle repeats itself; it **always gets** the 25th leap day. All other century years listed in the table **always get** the 25th leap day.

Algorithm #2 JAK-Perpetual-Solar-Calendar Algorithm

Solar year = 365 days 5 hours 48 minutes & 46 seconds

5 hrs. 48 min. 46 sec. = 20,926 seconds

x 100 years

surplus seconds: 2,092,600

2,092,600 / 86,400 = 24.2199074074 days per century

.2199074074 days = 19,000 seconds of surplus

19,000 x 4 centuries = 76,000 surplus seconds

(add 25th day) - 86,400 (400 years)

-10,400 **deficit**

x 8 time periods

-83,200 deficit

(**don't** add 25th day) + 86,400 (3,200 years)

3,200 surplus

x 27 time periods

86,400 surplus

(add 25th day) - 86,400 (86,400 years)

0

Perpetual Solar and Seasonal Calendar **aligned** with the solar year.

OPERATION -- Preferred Embodiment

[0020] The JAK-Perpetual-Solar-Calendar algorithmic scenario "400 years, 3,200 years, 86,400 years" yields a much shorter life cycle than the current state of the art and corrects the problem of deleting common days. If we take the 10,400 second deficit that occurs at the 400-year interval with the Gregorian calendar scenario and let it grow for 8 time periods (3,200 years) instead of 10 time periods, the deficit grows to 83,200 seconds. If, at that time, we **don't** add the 25th leap day, this transaction leaves us with a 3,200 second **surplus**. This scenario continues for 27 time periods (86,400 years) at which time we add the 25th leap day and the calendar is **aligned** with the solar year. The preceding Algorithm #2 scenario of this specification more clearly portrays these events.

[0021] State of the Art technology and wisdom suggests that the solar year is exactly 365 days 5 hours 48 minutes and 45.9747 seconds long (How they compute this with so much precision, I do not know). That's .0253 seconds short of the 46 seconds I used as the standard in the JAK-Perpetual-Solar-Calendar algorithm, which yields the result of the 86,400-year cycle. This difference produces the following:

> The present invention is accurate to within one day every 3,415,019.762846 years; or accurate to within one second every 39.5256916996 years, or 2,185.92 seconds (36 minutes and 25.92 seconds) every 86,400 years. So for every major cycle this system completes, it will be off 2,185.92 seconds or just over ½ hour. To compensate for this, a 25th day would **not** be added at the end of the 20th major cycle of 86,400 years (1,728,000 years), thereby keeping this system to within ½ day of accuracy as opposed to being off by one complete day in 3,415,019 years.

[0022] The other improvements that the present invention makes are as follows:

(a) The shifting of the entire calendar by eleven days (from April 1 to March 21), thereby causing the seasons of spring and winter to start on the beginning of April and January, respectively;

(b) The reassignment of May, June, July, August, and September each having 31 days and all other months having 30 days, thereby causing the other two seasons to begin on the first of July (summer), and the first of October (fall);

(c) The moving of New Year's Day to April 1, the first day of spring; and

(d) The reassignment of leap day to occur on March 31, the last day of the year.

[0023] In practice, the JAK-Perpetual-Solar-Calendar *manual* algorithm of my calendar system can be incorporated into electronic devices as software (*automatic* algorithm) or hard-wired into them as ROM and we shall never have to worry about which future centuries will have the 25th leap day. All in all the Perpetual Solar and Seasonal Calendar is a much smarter calendar, one that our society is ready for.